

In the Claims:

Claim 40 (currently amended): A method for identifying a non-oligomeric ligand that binds to a target protein wherein said ligand ~~is not a peptide and~~ is less than about 2000 daltons in size, said method comprising:

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- a) obtaining said target protein comprising a -SH group, masked -SH group, or activated -SH group;
 - b) combining said target protein with one or more non-oligomeric ligand candidates wherein said ligand candidates each comprises a disulfide bond, and wherein said ligand candidates ~~are not peptides and~~ are each less than about 2000 daltons in size;
 - c) forming a covalent target protein-ligand conjugate wherein at least one ligand candidate binds to the target protein and forms a disulfide bond with the target protein under disulfide exchange conditions; and
 - d) detecting the formation of said covalent target protein-ligand conjugate and identifying the non-oligomeric ligand present in said conjugate.

Claim 41 (previously added): The method of claim 40 wherein the ligand is less than 1500 daltons.

Claim 42 (canceled)

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Claim 43 (previously added): The method of claim 40 wherein the ligand is less than 750 daltons.

Claim 44 (canceled)

Claim 45 (previously added): The method of claim 40 wherein step b) is performed in the presence of a reducing agent.

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Claim 46 (previously added): The method of claim 40 wherein step c) is performed in the presence of a reducing agent.

Claim 47 (previously added): The method of claim 45 or claim 46 wherein the reducing agent is 2-mercaptoethanol.

Claim 48 (previously added): The method of claim 40 wherein the formation of the target protein-ligand conjugate is detected using mass spectrometry.

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Claim 49 (previously added): The method of claim 48 wherein the target protein-ligand conjugate is subjected directly to mass spectrometry analysis.

Claim 50 (previously added): The method of claim 48 wherein the target protein-ligand conjugate is fragmented prior to mass spectrometry analysis.

Claim 51 (previously added): The method of claim 49 or claim 50 wherein the mass spectrometry analysis also identified the ligand is said conjugate.

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Claims 52-58 (canceled)

Claim 59 (currently amended) A method for identifying a non-oligomeric ligand that binds to a target protein wherein said ligand ~~is not a peptide and is between about 200 and about 2000~~ less than about 750 daltons in size, said method comprising:

a) obtaining said target protein comprising a -SH group, masked -SH group, or activated -SH group;

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b) combining said target protein with one or more non-oligomeric ligand candidates in a mixture wherein said ligand candidates ~~are not peptides and are each less than about 2000~~ 750 daltons in size;

c) forming a target protein-ligand conjugate wherein at least one ligand candidate binds to the target protein and forms a covalent disulfide bond with the target protein under disulfide exchange conditions;

d) separating the covalent target protein-ligand conjugate from the mixture; and

e) identifying the ligand present in said conjugate.

Claim 60 (previously added) The method of claim 59 wherein the ligand is identified using mass spectrometry.

Claims 61-63 (canceled)